# Defence Industrialisation in Malaysia: Development Challenges and the Revolution in Military Affairs

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Despite limited resources for socio-economic development, developing countries establish and maintain indigenous arms production. They do so for both defence self-reliance and wider economic development reasons, even though they need to import such critical inputs as design, systems engineering, high-tech components and sub-systems. Against this background, this article analyses Malaysia's experience with defence industrialisation and highlights the challenge faced by developing countries wishing to join the revolution in military affairs.

In recent years, the technological gap between the developed and developing countries has further widened due to various factors. These include the lack of qualified human resources within host economies to absorb technology, lack of investments, stringent export controls imposed by arms producing nations[1] and, often, the reluctance of Original Equipment Manufacturers (OEM) to transfer critical technologies for fear of potential competitors eating into their market share.[2] Observers have also argued that developing countries find indigenous arms production particularly costly, with barriers to technology transfer from military to civilian applications exacerbated by the secrecy with which the military handles most of its research and development (R&D) projects and manufacturing processes, the importance paid to cost rather than performance of equipment, the complexity of programs and the lack of economies of scale.[3] Why, then, do small developing nations still persist in pursuing defence industrialisation?

[1] Kwang-Il Baek, Ronald D. McLaurin, and Chung-in Moon (eds), *The Dilemma of Third World Defence Industries: Supplier Control or Recipient Autonomy?* (Boulder, CO: Westview Press, 1989); Luis Bitencourt, 'The Problems of Defence Industrialisation for Developing States', in Sverre Lodgaard and Robert L. Pfaltzgraff, Jr (eds), *Arms and Technology Transfers: Security and Economic Considerations among Importing and Exporting States (*New York and Geneva: United Nations Institute for Disarmament Research (UNIDIR), 1995), pp. 167-75.

[2] For further discussion on the widening technological gap between developed and developing countries, see A. A. Moghadam, *The North-South Science and Technology Gap (*London: Taylor and Francis, August 1991); Verspagen Bart, *Uneven Growth between Interdependent Economies: A Evolutionary View on Technology Gaps: Trade and Growth* (London: Avebury, 1993).

[3] For a detailed discussion on arms production in the third world see S. S. Neuman, 'International Stratification and Third World Military Industries', *International Organization,* vol. 38, no. 1 (1984), pp. 167-97; J. E. Nolan, *Military Industry in Taiwan and Korea* (London: Macmillan, 1986); Ragunathan, 'India's Move Towards Defence Self-Reliance, and the New

Despite having limited resources for socio-economic development, developing nations spend large proportions of their budgets on defence. Recently, developing countries have begun producing arms for non-economic and economic reasons.[4] Non-economic reasons for developing nations to pursue arms production include the need to overcome weapon embargoes.[5] Political motives include considerations of foreign policy and the leveraging of military production for regional power recognition.[6] Developing nations have recognised the benefits of building a defence industrial base that is capable of supporting self-reliant armed forces, further adding to their defence capability.

In an economic sense, developing countries pursue defence industrialisation as a catalyst for capacity-building, creating high-value added products, promoting backward linkages to support industries, as well as dual-use technology, employment, export promotion, absorption of high-technology and spin-offs that boost the civilian economy.[7] Latecomers to defence industrialisation include Argentina, India, Turkey and South Africa, all of whom have pursued aggressive defence industrialisation strategies with the aim of achieving technological and industrial development. Small emerging economies, such as Malaysia, aspire to go down a similar route.

Malaysia decided to undertake defence industrialisation for both economic and military reasons. Defence industry development was mainly aimed at self-reliance in spares and logistic support, modification, upgrades, retrofits, maintenance, repair and overhauls without foreign assistance.[8] Malaysian governments considered domestic defence industry an essential element of sustainable self reliance by ensuring the continuous supply of weapons,

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Search for Defence Exports', *Defence &Foreign Affairs*, vol. 18, no. 4 (April 1990), pp. 29-31; J. Katz, *Arms Production in Developing Countries* (Lexington Mass, Toronto: Lexington Books, 1984); B. Hagelin, *Military Production in the Third World*, FOA Report C 10230-M3 (Stockholm: National Defence Research Institute, June 1983); J. S. Gansler, *The Defence Industry (*Cambridge :MIT Press, 1980); C. Evans, 'Reappraising Third World Arms Production', *Survival*, vol. 28, no. 2 (March/April,1986), pp. 99-118; Ron Matthews, *Defence Production in India* (New Delhi: ABC Publishing House, 1989), p. 8. For further details on barriers to technology transfer see Jordi Molas Gallart, *Military Production and Innovation in Spain* (Switzerland: Harwood Academic Publishers, 1992).

[4] Richard A. Bitzinger, 'Towards a Brave New Arms Industry'*, Adelphi Paper 356* (London: International Institute of Strategic Studies, May 2003).

[5] Jurgen Brauer and J. Paul Dunne, *Arming the South: The Economics of Military Expenditure, Arms Production and Arms Trade in Developing Countries (*New York: Palgrave, May 2002), pp. 106-117.

[6] Ron Smith, Anthony and Fontanel Jacques, 'The Economics of Exporting Arms', *Journal of Peace Research*, vol. 2, no. 3 (1985), pp. 39-247.

[7] See also Raimo Vayrynen, Mi*litary Industrialisation and Economic Development: Theory and Historical Case Studies* (Aldershot: Darthmouth, 1992).

[8] Self-reliance in the Malaysian context is defined as the ability to provide the Malaysian Armed Forces independence in all aspects of defence, including spares and for maintenance and repair without relying on overseas suppliers.

ammunitions and spares in times of crisis, thus ensuring the performance of weapons procured is not prejudiced by the withholding of overseas supply. A defence industrial base is also considered a good way to create high technology employment, value-added work and also backward linkages in support of small and medium scale industries, especially heavy manufacturing industries and dual-use technology. Strategically, Malaysia also pursues defence industrialisation to obtain high-end sensitive military technology and know-how as well as economic spin-offs to the non-defence sectors.

The state continues to play a vital role in nurturing Malaysia's defence industry through mechanisms such as defence procurement and offsets. The government invests a large amount of financial and human resources in the development of Malaysia's defence industry. The question, however, is whether after more than thirty years of investment, the defence industry has attained the capability and performance expected? Has there been sufficient attention and resources allocated to the growth of this sector? What have been the challenges faced by the industry during its development path? Has the defence industry been treated as a strategic industry for political reasons, rather than as a vehicle for industrial and technological development of the country? Finally, has Malaysia's defence industry policy focused sufficiently on the development of strategic sectors, identified the challenges, and considered the strategies that can move the Malaysian defence industry forward?

In answering these questions this paper is structured as follows:

- The emergence of Malaysian defence industry policy is placed into the wider context of Malaysian defence self reliance;
- The development of Malaysia's defence industry is then placed into the context of the country's wider economic development and industrialisation;
- The institutions through which the Malaysian state influences defence industrialisation are then summarised;
- The paper concludes with an assessment of Malaysian defence industry and the Revolution in Military Affairs (RMA).

## Malaysia's Defence Industrial Policy and Defence Self Reliance

This section of the paper summarises the evolution of Malaysia's strategic perceptions and explains the development of defence industry policy as a consequence.

> Malaysia's defence policy, its armed forces structure and also procurement decisions, are strongly influenced by the political vision of the country's leaders. When Malaysia attained independence in 1957, the absence of external threats and the significant presence of Commonwealth forces left the military with no definitive role apart from assisting the police in the maintenance of law and order, given. However this scenario changed during the 1963 Malaysia–Indonesia confrontation.[9]

Britain's decision to accelerate military withdrawal from Malaysia and Singapore, the escalation of Communist activity, post 13 May 1969, and the Sabah 'Annexation' Act by the Philippines Congress, forced the Malaysian government to take a more serious approach to defence. In 1969, the late Tun Abdul Razak (then Deputy Prime Minister as well as Minister of Defence) emphasised the need

> to review the whole defence structure … to formulate new defence arrangements … in the light of the likely threat, both internal and external, to the security and stability of this region to be more self-reliant as a nation … (and) to meet new additional responsibilities.[10]

This set the tone for Malaysia's defence policy which placed greater emphasis on 'self-reliance' in defence and on developing a defence force more obviously geared to external security. Regional instability and uncertainty, following the withdrawal of American forces from South East Asia after the fall of South Vietnam in the 1970s, further increased Malaysia's need to strengthen national security.[11]

As a result, and as the *Yang Di- Pertuan Agung* declared at the 1975 Malaysian Parliamentary session:

> Formerly, the primary role of the armed forces was to assist the police on preserving peace in the country. Today, their primary role is to defend the country against external threat and aggression.[12]

In the 1980s, during the tenure of the late Prime Minister, Tun Hussein Onn, defence was allocated one of the largest budgets ever, some RM 7.19 billion or 18.3 percent of overall government budget to modernise and upgrade the armed forces' capability under a special program called PERISTA *(Perkembangan Istimewa Angkatan Tentera)*.[13] The changing role of the Malaysian Armed Forces (MAF) from a counter-insurgency force towards acquiring capabilities in conventional warfare to counter external threats

[9] Brigadier General (Rtd) Dato' Richard, Robless, 'Harmonizing Arms Procurement with National Socio-Economic Imperatives', in *97 Workshop on Defence, Kuala Lumpur, 1997 (*Malaysia, KL: Ministry of Defence, 1997).
[10] Chandran Jeshurun, *Malaysian Defence Policy—A Study in Parliamentary Attitudes 1963-73* (Kuala Lumpur: Penerbit University Malaya, 1980), p. 126.
[11] Also see Chandran Jeshurun, *The Growth of the Malaysian Armed Forces 1963-77: Some Foreign Press Reactions* (Singapore: Institute of South East Asian Studies, 1975).
[12] The Royal Address to Parliament, *Proceedings of the D.R, V/1*, 23 May 63, Col.22 (1975)
[13] Also see Tim Huxley, *Defending the Lion City: the Armed Forces of Singapore* (Australia: Allen&Unwin, 2000), p. 65.

required massive modernisation of the armed forces.[14] However, the modernisation effort that was put on hold in the mid-1980s, due to economic recession, and was reinstated in the early 1990s by the MAF under the leadership of Tun Dr. Mahathir Mohammad (the fourth Prime Minister of Malaysia). Defence was once again allocated a huge budget under the 8th Malaysia plan, amounting to RM 17 298 million or 10.2 percent of Malaysia's national budget. This high level of defence expenditure was due to the cost of adjusting the MAF operations, equipment and technology in preparation for the new security challenges and modern warfare of the 21st century.[15]

While Malaysia's evolving defence policy is thus derived from and subordinate to its foreign policy, Malaysian foreign policy decisions are largely idiosyncratic, being mostly made by the prime minister in power.[16] Hence Malaysia's defence policy guidance for determining capability requirements and subsequent planning for arms procurement is politically-driven. To date, the country does not have a defence White Paper defining Malaysia's security concerns.[17] Rather, Malaysia's defence policy is defined in a 1997 Ministry of Defence (MOD) document which sets out three fundamental principles: national strategic interest; principles of defence; and the concept of total defence.

Based on Malaysia's strategic interest, self-reliance of the MAF became an underpinning requirement for internal and external security of the nation. The nation's strategic interests lies at three different levels: the immediate vicinity, including land territories, territorial waters, exclusive economic

[14] The armed insurgency problem ended with the signing of a peace treaty with the Communist party of Malaya in December 1989. The modernisation was mooted in the early 1980s through PERISTA (special expansion) program but was later ceased due to the recession in the mid-1980s and resumed in 1987-1997 just before the Asian Financial Crisis.

[15] For further details, see P. Sengupta, 'The MAF and Force Modernisation Challenges in the Post-Cold War Era', *Asian Defence Journal*, vol. 4 (1998), pp. 16-7; E. Dantes, 'RMN's Force Modernisation Plans', *Asian Defence Journal*, vol. 12 (1997), pp. 14-21.

[16] See Johan Saravanamuttu, 'Iconoclasm and Foreign Policy—the Mahathir Years', in Bridget Welsh (ed.), *Reflections: The Mahathir Years (*Washington, DC: Southeast Asia Studies Program, Johns Hopkins University-SAIS, 2003); Joseph Liow, 'Personality, Exigencies and Contingencies: Determinants of Malaysia's Foreign Policy in the Mahathir Administration', in Ho Khai Leong and James Chin, *Mahathir's Administration: Performance and Crisis in Governance (*Singapore: Times Books, 2001), pp. 120-60; David Camroux, *Looking East and Inwards: Internal Factors in Malaysian Foreign Policy, 1981-1994,* Asia Paper, no. 72 *(*Australia: Griffith University, 1994); Johan Saravanamuttu, *The Dilemma of Independence: Two Decades of Malaysia's Foreign Policy, 1957-1972 (*Penang: Universiti Sains Malaysia for School of Social Sciences, 1983); Johan Saravanamuttu, 'Malaysia's Foreign Policy in the Mahathir Period, 1981-1995: An Iconoclast Comes to Rule', *Asian Journal of Political Science*, vol. 4, no. 1 (1996), pp. 1-16; Johan Saravanamuttu, 'ASEAN in Malaysian Foreign Policy Discourse and Practice, 1967-1977', *Asian Journal of Political Science*, vol. 5, no. 1 (1997), pp. 35-51; Shanti Nair, *Islam in Malaysian Foreign Policy (*London: Routledge, 1997).

[17] A document detailing defence policy was presented before the National Security Council in 1987 endorsed by Cabinet in 1990. In late 1997, a MOD publication described its organisational structure and strategy perspective. Malaysian MOD, 'A Protection of its National Security', *Malaysian Defence: Towards Defence Self-Reliance (*Kuala Lumpur: MOD, 1997), p. 21.

zones, the Straits of Malacca and the Straits of Singapore; regional interests including South East Asia, the Andaman Islands and the South China Sea; and Malaysia's growing interest beyond the region due to its growing trade links and increasing foreign direct investment.

These developments in strategic thinking have had direct implications for Malaysian defence industry policy.

The defence industry forms an integral part of the defence capability of any country. In the case of Malaysia, and in principle, the defence industry is categorised as a 'strategic industry' with the prime purpose of helping the MAF attain self-reliance in the procurement and support of equipment. Hence the growth and development of this industry is overseen by the Ministry of Defence rather than the Ministry of International Trade and Industry (MITI). In practice, however, Malaysia lacked a formal approach to arms production since 1957. Government decisions about defence production have been largely *ad-hoc*, geared towards meeting individual needs of each branch of the MAF through in-house facilities.

One consequence of this lack of defence industry policy was minimal defence industrialisation. Initially, industrial participation was completely neglected in both defence procurement and national industrial development plans. The absence of a Defence Acquisition Strategy had failed to address the issue of local industrial participation and development from the outset of procurement.

In 1982, the government initiated a formal approach to defence production policy by introducing the National Defence Production Policy (NDPP), the first written framework for the development of the Malaysian defence industries. Under this policy, defence items were classified into three categories, namely, 'strategic', 'essential' and 'non-strategic'.[18] This policy recognised the need for self-reliance in some areas, with government undertaking the production of strategic items while semi-government and the private sector ventured into the non-strategic and essential items. A national Defence Production Committee (NDPC) headed by the Deputy Minister of Defence was set up to oversee the implementation of the NDPP. However, the Committee's efforts to implement the NDPP were disrupted due to the economic recession in the mid-1980s, having a drastic impact on military expenditure. Plans for weapons acquisition and all other defence-related activities had to be put on hold and this also had a direct effect on the implementation of the NDPP. With no new equipment forthcoming, defence industry expenditure was channelled towards extending the shelf-life of

[18] Strategic items include defence equipment/services which impact on the operational ability of the MAF such as ammunition, armoured vehicles, fighter aircraft, naval ships and like items. Non-strategic items include items such as clothing, transport vehicles, edible equipment and common-ser items. Essential items are those that comprise defence equipment services which do not directly impact on in the operational ability of the MAF.

existing equipment through upgrades and overhauls. Sadly, the NDPP was completely abandoned later on.

The MAF, however, realised that it is crucial to have a capable defence industry during war time. The Malaysian government also recognised that defence industrial capability is crucial in supporting the development of a credible and effective fighting force. Accordingly, in 2005 the MOD published the Defence Industry Blueprint (DIB) with the main objective of creating a defence industrial base able to provide first-line support to the MAF mainly in through-life support and spares.

The DIB is described in greater detail below. Here, the key point is that the government realised that no country outside the United States can afford to have a 'cradle to grave' defence industry in every sector.[19] Malaysia's policy of DIB modernisation is, therefore, gradual, cautious, non-ambitious and pragmatic, aimed at efficiently and effectively sustaining the equipment purchased. The nation's capacity-building focused on through-life support and developing the skills of MAF personnel and defence industry members.[20] The defence industry is also viewed as a source of employment for retired MAF personnel who have been commercially trained whilst in service.

The government looks to implement defence industrialisation through a *public-private partnership.* Efforts have been made to increase local defence industry capabilities through government initiatives at various levels, including local content requirements and industrial participation through defence procurement and offsets, promotion of defence industrial collaboration through bilateral defence industry and defence science and technology cooperation and the award of long term contracts to deserving local industries.[21]

There are also continuous efforts to encourage dual-use technology for industrial growth as the country's defence industrial base is small. A dual-use strategy is employed to assist these industries to adapt to changes in supply and demand and keep production lines active. The government's aim

[19] Zakaria, Hj. Ahmad, National University of Malaysia, 'Cautious is the Catchword in Drive for Defence Industrialization', *Jane's Defence Weekly* (26 November 1997).
[20] For further details, see the exclusive interview with former Secretary General, Ministry of Defence, Malaysia, Tan Sri' Dato' Subhan, Jasmon, 'Malaysia Wants High-Value Long-Term Partnerships', *Asian Defence and Diplomacy* (May 2004), pp. 26-7.
[21] Treasury letter, reference S/K.KEW/PK/PP/1100/000000/11/11(8), entitled *Garis Panduan Kontrak Jangka Panjang untuk Membangunkan Industri Pertahanan Negara,* 8 April 2004. The Guideline takes into consideration: i. overall long term needs of the Armed Forces; ii. recent technological trends; iii. casting policy; and finally iv. current government policies. The Guideline is aimed at strategic purchases that involve high investment in terms of infrastructure, equipment/machinery, human resources and R&D efforts. The long term contract will take into consideration issues such as corporate governance, local companies, beneficiaries of offsets program and compliance in terms of being registered with the Ministry of Finance.

is to maintain a diversified industrial base as a priority policy option.[22] As most of the country's major defence platforms are bought from overseas, the government requires local defence industry participation during the initial planning stages, though there is always a battle between quality and performance of the equipment and national economic development aspirations. The government has been leveraging defence purchases to develop in country human skills of both the MAF and the defence industry, particularly in first- to third-line Maintenance, Repair and Overhaul (MRO), upgrades, retrofits, basic assembly, systems integration and logistics systems.

In recent years, Malaysia has also viewed the defence sector as a vehicle to acquire high-end defence and aerospace-related technology that could alleviate the country's low technological level. This could then indirectly create spin-offs, such as high value-added employment, indigenous technological and industrial development, skills development and penetration into the global supply chain. The government's initiative to incorporate the need for high technology and value-added activities, as well as highly skilled manpower, was reflected in its national development goals, including the New Economic Policy, the Industrial Master Plan, National Aerospace Blueprint, privatisation, contractorisation and Vision 2020. Interestingly, despite the absence of a written defence industrial policy, the government aims to create a developed nation by the year 2020, with fully developed technological and industrial capabilities and highly trained human resources.

## Malaysian Economic Development and the Origins of its Defence Industry

Malaysia's defence industrial base started to develop much later than many of its neighbouring countries, such as Indonesia, Singapore, the Philippines and Thailand. The country's defence industrial base has advanced in the past twenty years due to the government's strong drive to promote a home grown defence industry capable of supporting the nation's tri-services.[23] This focus on defence industry needs to be considered in the context of the country's overall Industrial Master Plan[24] and import substitution strategies.

Malaysia hardly had any active industrial development program before Independence in 1957. There existed only pockets of small enterprises

[22] Dual use strategy is one where companies involved in the production of commercial items are also involved in production of defence related equipment and vice versa. This will reduce the companies' total dependence on defence business and instead concentrate on promoting dual use technology.

[23] Bilveer Singh, 'Defence Industrialisation and the prospects for Security Cooperation in Southeast Asia, the Multilateralisation of Pacific Asia', in 94 Defence Services Asia (DSA) Conference, Kuala Lumpur, 21-22 April 1994.

[24] For further explanation of the Industrial Master Plan, see Chee Peng Lim, *Industrial Development: An Introduction to the Malaysian Industrial Master Plan* (Kuala Lumpur: Pelanduk Publications, 1987).

generally owned by Chinese, with larger enterprises dominated by foreigners, mostly British.[25] This situation changed after Independence when the government started encouraging industrial development to promote greater diversification and growth in national output.[26] In the 1960s and early 1970s, there was a political will to drive Malaysia down the import substitution strategy route,[27] trying to create the demand for domestic production with the intention of reducing exports due to the steady worsening of the country's terms of trade.[28] Yet this Import Substitution Industrialisation (ISI) strategy was not applicable to the defence industry sector *per se*.

During the initial development stages, Malaysia viewed ISI in the defence sector as providing the educational outcome of learning by doing.[29] Malaysia's defence industry was very much a government-led initiative, with most of the defence production facilities operating within the MAF's domain. Until the late 1980s, defence industrialisation had been minimal, and there were no significantly important production plants.[30] The government's focus centred on three main sectors: aerospace, maritime and ordnance.

In the mid-1980s, Malaysia decided to embark more aggressively on an ISI policy focusing on heavy industrialisation in line with the government's launch of the Industrial Master Plan[31]. The Mid-term review of the Fourth Malaysia Plan (1981-1985) stated that:

> The government has been promoting the development of heavy industries in order to strengthen the foundation of the manufacturing sector. Heavy industries are needed to create new engines of growth and to provide strong forward and backward linkages for the development of industries. Heavy industries can also have substantial effects on the growth of small-scale industries if efforts are made to establish linkages and integrate small scale industries development with heavy industries.[32]

[25] Edward Lawrence and Wheelwright, *Industrialisation in Malaysia* (Melbourne: Melbourne University Press, 1965).
[26] See D. Lim, *Economic Growth and Development in West Malaysia* (Kuala Lumpur: Oxford University Press, 1973).
[27] For a thorough explanation of the Import Substitution Policy in Malaysia, see Rokiah Alwi, *Industrialisation in Malaysia: Import Substitution and Infant Industry Performance* (London and New York: Routledge, 1996).
[28] Ibid.
[29] See Nicole Ball, 'The Political Economy of Defence Issues and Perspectives', in Andrew L. Ross (ed.), *The Political Economy of Defence: Issues and Perspectives (Contributions in Military Studies)* (Westport: Greenwood Press, 1991).
[30] Zainal Abidin Hj Ahmad, 'Malaysia's Defence Production Needs and Policy', in *91 DSA Conference, Kuala Lumpur, April, 1991* (Kuala Lumpur: MOD, 1991) p. 8.
[31] The Industrial Master Plan (IMP) formulated in 1985 maps out the path for Malaysia's industrial development. IMP proposes the type of industrial policies which Malaysia should adopt and the strategies to achieve the objectives set out. Currently, Malaysia has recently published its 3rd IMP (2006-2020).
[32] Malaysia. *Mid Term Review of the Fourth Malaysia Plan, 1981-1985* (Kuala Lumpur: Government Printer, 1984), pp. 271; also see Tahir Abdullah Mohamed , 'Industrial Policy and

The general concentration on heavy industries—mainly the basic metals industry, including iron and steel and non-ferrous metals, machinery and equipment, general engineering, transport equipment and petro-chemicals—had a profound impact on defence industrialisation. The need for force modernisation under PERISTA 2 and also the government's strategy to privatise and corporatise many of its defence facilities gave birth to several defence prime contractors. Despite this industrial push, much of the defence industrial capability remained shallow and heavily engaged in MRO type of work, with minimal in country assembly, co-production and licensed production work.

A further phase of defence industrialisation started between the late 1980s and mid-1990s, with Malaysia commencing another set of MAF modernisation programs. In the early 1990s, Malaysia's need for defence industrialisation grew stronger for several reasons. The country realised that other developing countries were heavily engaged in defence industrialisation and were far ahead by this time. Brazil, Turkey and India, for instance, were able to manufacture their own platforms. Nearer to home, Indonesia and South Korea were also heavily engaged in arms production. Singapore grew strong in MRO capabilities and was able to become the regional aerospace service centre. Malaysia monitored this progress closely, not wanting to be left behind in terms of defence industrialisation. Politically, Malaysia was trying to position itself as a strong and economically progressive country in South East Asia and wanted to acquire defence production capability to demonstrate self-reliance by its armed forces. At the same time, Malaysia also realised that the defence industry was a crucial means of acquiring high technology, capacity building and a strong and capable industrial base as a prerequisite for absorbing imported technology. Investing in the development of defence technology is costly and involves research and development as well as highly skilled human resources. Arguably, the best way to acquire these technologies is through a defence industrial strategy.

This was also an era when Malaysia was enjoying rapid civil industrialisation. This strength was used as an advantage to attract some of the civil-related companies to venture into the defence sector. Many of these companies, like DRB-HiCOM and Sapura Telecommunications, had established capacity to supply and support defence equipment as a deliberate commercial strategy. Malaysia viewed the dual-use technology path as a more viable option for local defence industrialisation. This was mainly because the requirements of the MAF were generally too small for viably setting up of facilities solely dedicated to defence production. Therefore, many of Malaysia's defence companies have taken the safe approach of catering to both defence and civil markets at the same time. This worked well during

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Industrial Development: Issues and Policy Directions', in V. Kanapathy (ed.), *Managing Industrial Transition in Malaysia* (Kuala Lumpur: Pelanduk Publication,1995).

the economic downturn and associated defence budget cuts, allowing these industries to immediately re-strategise and concentrate on civil markets. Today, the government focuses on the defence and aerospace sectors as a source of high technology.[33]

Malaysia applies a strong interventionist policy towards the development of its defence industry. The government has adopted a policy of nurturing and supporting the industry up to the point of which local companies are able to support themselves. According to the Minister of Defence, Malaysia, Dato' Seri Najib Tun Razak:

> To realise the goal of self-reliance in defence production and product support for the Malaysian Armed Forces, there is a need to develop our local defence industry in an orderly and systematic manner. There is a strategic consideration to be taken into account and there is also an economic factor that we cannot ignore. Therefore, there is a need to have close interplay between the Malaysian Armed Forces, i.e. the user, the local defence industry, the supplier, and the government agencies, which will facilitate in the areas of government funding, transfer of technology, tax incentives etc.[34]

The next section of the paper explains the key institutions through which the Malaysian Government influences Malaysian defence industrialisation.

## Defence Industrialisation and the Role of the State

In promoting Malaysia's defence industrial base the Malaysian Government has had to reconcile, on one hand, the interest of the MAF in high quality equipment and, on the other hand, the Treasury's requirement to minimise the costs of equipment. In striking the appropriate balance the government realises that promoting defence industrialisation can sometimes compromise economic efficiency and effectiveness within the overall economy, at some cost to tax payers.[35] The institutions by which this balance is managed are described below.

There are several government agencies and defence organisations responsible for the development of Malaysia's defence industry. The Defence Industry Division (DID), formed in 1972, is the key Agency overseeing Malaysia's defence industrial progress. This Division situated within the MOD, is headed by an Under-Secretary, and has four main units: Defence Industry Development; Offsets; Defence Industry Bilateral; and

[33] Defence Industry Division, MOD, SDSC Conference on Implications of New Technology for Australian and Regional Security, The Malaysian Perspective, 29-30 November 1989.
[34] See Zakaria Hj. Ahmad, 'Defence Industry in Malaysia', in 94 Conference on European Defence Industry in the Global Market: Competition or Cooperation?, Chatham House, 20-21 May 1994, p. 5.
[35] For further discussion on the role of government in Malaysia, see Sanjaya Lall, 'Malaysia: Industrial Success and the Role of Government', *Journal of International Development,* vol. 7 (2001), pp. 759-73.

Defence Exhibitions and Privatisation.[36] The main aim of the DID is to oversee Malaysia's defence industry development through active participation and promotion of the defence sector locally and abroad through bilateral platforms and defence air shows, as well as assisting and preparing the industry to face current and future challenges.[37] The Department tries to promote and assist joint ventures and export markets through bilateral defence industry cooperation and defence exhibitions worldwide.

The DID's efforts are supported by the Malaysian Defence Industry Council (MDIC),[38] a private sector initiative, begun in 1990[39] to promote defence industrialisation in Malaysia. The MDIC is chaired by the Minister of Defence, with representations from various government and semi-government agencies, as well as defence companies. It is focused on steering orderly development of the defence industry, taking into consideration the objectives of the government, as well as that of the nation as a whole. The MDIC consists of six sectors; aerospace, maritime, automotive, weapons, ICT and common-users. Each sector is headed by an industry member, hand-picked and nominated by the Minister of Defence. The key objective of this council is to meet at least twice a year and to use this platform to discuss various issues that could assist in defence industrial development. This forum has been instrumental in formulating various policies that assist Malaysian defence company progress. The MDIC has also acted as the platform for open discussions on defence industry-related issues. The council's support has been the backbone to DID's efforts in promoting the Malaysian defence industry sector.[40] The Council has been responsible for formulating several important policies in support of local defence industries, including long-term contracts, offsets policy and the

[36] The offsets unit was re-structured in the year 2003 to create two additional open posts to incorporate one military appointment as well as one from the other services, such as university, researchers or the Police Force. Prior to this, offsets management was handled by a Principal Assistant Secretary and was assisted by an Assistant Secretary and clerical staff. The military and other services were incorporated to bring in technical expertise mainly to handle offsets negotiations.

[37] The DID's functions include: promoting the development of local defence manufacturing and maintenance capabilities; implementation of defence privatisation policy and projects; implementation of offsets programmes and transfer of technology activities; monitoring of companies under the supervision of MOD and also secretariat support to the international defence exhibition.

[38] See Ministry of Defence, Malaysia (MOD), Malaysian Defence Industry Council (MDIC), [online] (Kuala Lumpur: MOD, 2006), for further details on the formation, functions and members of the Malaysian Defence Industry Council, available at <http://nwww.mdic.mod.gov.my> [Accessed 24 September 2006].

[39] Although the council was formed in 1990, it did not really take-off until 1997. A few of the MDIC members re-started the MDIC initiatives. The Defence Industry Division, as the secretariat to the MDIC, has been tasked to review the composition of members as well as the fundamental objectives of this council.

[40] The initiatives of the MDIC include the Malaysian Defence Industry Bulletin which focuses on defence industry development in Malaysia, the Defence Industry Directory, published in 2005 and the defence industry inward and outward trade mission.

defence industry blue-print. However, some observers see the Council as nothing more than a 'talking shop'.[41]

As defence technology and research and development (R&D) are important elements in the development of the defence industry, the government set up in 1968 a Defence Research Organisation called the Defence Science Technology Centre (DSTC) within the MOD. DSTC has grown from an organisation of 182 people, to one with a total staff of 520.[42] This organisation was renamed as STRIDE[43] (Science, Technology and Research Institute for Defence) in 2002. STRIDE's task is to supply scientific and technical expertise to the MAF. The Agency has collaborated with several defence companies and universities on defence R&D projects. STRIDE's concern has always been the lack of government funding for defence-based R&D.[44] In 2002, a joint research fund was set up between STRIDE and the MDIC members, under the mandate of the MDIC to collaborate on defence R&D projects. Further, a body called the Intensification of Research in Priority Areas (IRPA),[45] the national R&D organisation, within the Ministry of Science and Technology, also provides support to defence R&D but sets a low level of priority to defence-related R&D research projects due to their lack of both commercial value and dual-use application.

The government has also sought to develop the civil aerospace sector, providing the vehicle for defence-related aerospace industry to spread its base. A special aerospace related agency called the Malaysian Industry Government Group for High Technology (MIGHT)[46] was set-up to plan and monitor the progress of the aerospace industry. The organisation was initially part of the Prime Minister's Department but is now currently part of the Ministry of Science and Technology. MIGHT updates on the progress of the aerospace defence industry in Malaysia. Since April 2004, MIGHT has also been appointed by the Ministry of Finance as the Technology Depository Agency (TDA). TDA's primary role is to ensure that technology acquisition meets the country's development objectives. TDA, therefore, compiles the country's technology wish-list and links these needs to

[41] Interview with Mr. Zubir Zakaria, Principal Assistant Secretary, Defence Industry Division, Ministry of Defence, Malaysia, 20 May 2006; also see 'Long-dormant MDIC is brought back to life', *Jane's Defence Weekly* (26 November 1997).
[42] STRIDE, Fieldwork survey in Malaysia, 30 April–31 July 2005.
[43] DSTC was formed in 1968 to provide scientific and technological advice to the MOD and MAF in meeting capability requirements as well as to carry out R&D in promoting local defence production. Its name was changed to STRIDE in 2003 and the facilities were moved to Kajang. STRIDE had around 500 scientists and engineers working for the organisation in 2007.
[44] Interview with Dr. Ghafar Ramli, Director of STRIDE, MOD and Malaysia, 15 June 2005.
[45] Intensification of Research in Priority Areas (IRPA) provides special incentives of 100 percent tax exemptions for firms investing in high technology operations.
[46] Malaysian Industry Group for High Technology (MIGHT) was formed mainly to assist the nation towards attaining and sustaining competitiveness in the high technology sectors.

government acquisitions.[47] MIGHT has also been appointed by the government to oversee the non-defence offsets sector.

Additionally, the Malaysian Aerospace Council was formed to oversee the development of the aerospace industry, including defence aerospace. The objective of this council is to monitor the overall development plan of the national aerospace industry, providing guidelines and identifying priority areas.[48] Linked to the Development Plan, is the 1996 Aerospace Blueprint.[49] The blueprint sets the vision and development strategy for the Malaysian aerospace sector. This blueprint takes into consideration the development of indigenous companies catering for both the defence and civil sectors. However, the government is said to have called for the blueprint to be reviewed to consider recent developments in the aerospace sector.

Other government agencies, such as the Economic Planning Unit, the Treasury and Ministry of International Trade and Industry (MITI), as well as the Malaysian Industrial Development Authority (MIDA), Malaysia External Trade Development Corporation (MATRADE), Entrepreneur Development Authority to facilitate progress of the Malaysian defence industry.[50] The Treasury imposes local content on purchases of big ticket investments. This is to ensure that local manufacturers, with the capabilities and infrastructure, are given opportunities to obtain work from overseas suppliers, wherever possible.[51]

The most recent development has been the formation of the DIB under the MDIC. The objective of the blue-print is to put in place a systematic plan for defence industrial development, as opposed to an *ad-hoc policy,* with a lack of planning on the promotion and development of strategic industries. The proposed blueprint has recommended five thrusts, namely, human resource and competency development, technology development, industry development, domestic defence procurement and international marketing, with twenty-three key initiatives.[52] As indicated earlier, this blueprint is the

[47] Lt Col, Kamarulzaman Zainal, Technology Depository Agency (TDA), in *05 Workshop on Making Offsets Works,* Menara Kuala Lumpur, 7 July 2005 *(*United Kingdom, Kuala Lumpur: Ministry of Defence, Malaysia and Cranfield University, 2005).

[48] Malaysian Industry Group for High Technology (MIGHT), *Malaysian Aerospace Council Report* (Putra Jaya: Ministry of Science, Technology and Environment (MOSTE), November 2005).

49 The National Aerospace Blueprint was formulated in 1996 with MIGHT providing the secretariat. The Blueprint recommends the establishment of a national level steering committee to oversee the development of the aerospace industry.

[50] The key ministries involved in overseeing offsets have officials represented at the MDIC. Most issues tabled at the meetings are brought to the attention of the respective ministries if they fall within the jurisdiction of any of the agencies concerned.

[51] The Local content Policy is contained in Treasury Circular WT/TPR/S/31 dated 3 November 1997. However, this circular is not brought to the attention of foreign suppliers most of the time or are blurred by technical issues disqualifying local participation on many occasions.

[52] 'Meeting on Industry Blueprint Action Plan', *Malaysian Defence Industry Council (MDIC) Bulletin (*December 2005), p. 10.

first strategic guidance towards the development of a structured defence industry base in Malaysia.

In implementing the DIB one of the key policy instrument available to the Malaysian Government is Defence Offsets which were introduced in 1990 by the United Kingdom when Malaysia bought the Hawk aircraft from BAE Systems. The positive result from some of the offsets projects culminating from this deal has encouraged the Malaysian government to incorporate offsets into all major defence procurement deals as a means of obtaining technology, work packages and skills enhancement through training and on-the-job experience. Offsets are seen as a way forward for industrial and technological development, particularly in the defence sector. The country's offsets initiative started around the same time as other developed and developing countries, such as the United Kingdom and South Africa, began to introduce their policies. Malaysia has been involved in the offsets business since the early 1990s. The country views offsets as an important tool to support its import substitution policy in creating a sustainable and competitive industry. Offsets are demanded through defence procurement for various reasons, including creating a defence industry base, employment creation, dual use industrialisation, skill development and sub-contracting work.

However, after more than ten years of offsets implementation, questions have been raised as to the effectiveness of offsets.[53] Have offsets worked in Malaysia? It is claimed, for instance, that arms manufacturing in Malaysia has been mainly low-tech and small scale.[54] The defence industry is still in the backwater and most of the companies still require government support. The National Plan of Action Report for the Coordination and Transfer of Industrial Technology to the Ministry of Science, prepared in 1990, was not required to incorporate offsets. Various reasons have been highlighted for this omission.[55]

OEMs argue that they are unable to transfer high technology work due to the lack of investment and skilled workers from the local companies to undertake production. The ratio of seven research scientists per 10 000 of the labour force in Malaysia is extremely low compared to that required for a technologically sophisticated industrial program.[56] A counter-argument is that OEMs are not genuine about releasing their technology via offsets.

[53] Issues pertaining to the impact of offsets on the Malaysian economy have been raised at high level meetings such as Cabinet meetings, MDIC meetings and at Defence Offsets Committee Meetings chaired by the MOD.
[54] See Richard A. Bitzinger, 'Offsets and Defence Industrialisation in Indonesia and Singapore', in Jurgen Brauer and J. Paul Dunne, *Arms Trade and Economic Development: Theory, Policy, Cases in Arms Trade Offsets (*London: Routledge, 2004), p. 255.
[55] The report is entitled 'Industrial Technology Development: Technology and the Environment'. See Sunil Mani, *Government, Innovation and Technology Policy* (Cheltenham: Edward Elgar Publishing Limited, 2002), p. 152.
[56] Ibid., p.153.

There is little local content in the defence equipment purchased. In line with the international product life cycle theory, only obsolete or third generation technology is passed on to the developing countries.[57] It is argued that most of the patents taken out by investors from Malaysia are in low-tech areas, such as assembly work, basic maintenance, rubber production, general cleaning, upgrade, metal fusion bonding, dispensing and optics.[58] Arguably, also the spill-over effects of offsets have not created sufficiently large backward and forward linkages in Malaysia.[59]

## Malaysia's Defence Industry: Structure and Capabilities

After more than thirty years of defence industrial ventures, the number of Malaysian defence companies has quadrupled—see Table 1. The defence industry started off as a pure government-based initiative with the formation of a few companies, mainly in aerospace and weapon production in the 1970s. These companies were mainly government-owned with facilities in the military environment. This pattern changed in the early 1980s when several of the government-owned companies were corporatised or privatised in-line with national privatisation policy initiatives. Since the early 1990s, most of the firms have become fully private firms. Further, there is an increase in the number of ICT and aerospace-related defence companies. This is due to Malaysia's focus on the aerospace sector, as a stepping-stone into high technology and civil manufacturing industry, particularly the electronic and electrical sectors.

Whilst there has been an increase in the number of defence companies in Malaysia, the question remains as to the depth and capability of the defence industry to undertake work beyond maintenance, repair, overhaul and low-end manufacturing of parts and components.[60] Despite thirty years of defence industry development, the Malaysian government and defence industry representatives are acutely conscious of the industry's lack of capabilities in major areas.[61]

As shown in Table 2, the Malaysian defence industry seems to have performed better in manufacturing and MRO activities; some of the defence companies even managing to penetrate the global supply chain in a more challenging environment, where prime contractors have the potential to

[57] Raymond Vernon, *Sovereignty at Bay: The Multinational Spread of US Enterprise* (New York: Basic Books, 1971).
[58] United States Department of Commerce, *United States Patent and Trade Mark Office,* [online] (Washington, DC: USTPO, 2006), available at <http://www.uspto.gov> [Accessed on 12 April 2006].
[59] Sunil Mani, *Government, Innovation and Technology Policy*.
[60] 'How SME has grown from Small Beginnings' *Jane's Defence Weekly* (26 November 1997).
[61] Information extracted from author's participation at the Defence Industry Blueprint Workshop organised by the MOD, Malaysia, held in Regency Hotel, Port Dickson, 22-24 June, 2005. The three day workshop was attended by representatives from relevant government agencies, MAF and defence industry companies from the MDIC Working Groups.

exploit their vertically integrated positions to win an increasing share of business. However, most of these companies possess only medium-level expertise in assembly work. The overall industry has only attained low levels of capability in research, development and design work.[62] Only a handful of these companies have been able to enhance their capabilities to become international players.

**Table 1: Expansion of Malaysia's Defence Industry (1970-2000)**

| Period | Company | Sector |
|---|---|---|
| *1970-79* | Aircraft Repair and Overhaul Depot (1976) | Aero-space |
| | Syarikat Malaysia Explosives Sdn Bhd (1972) | Weapons |
| | Tenaga Kimia (1976) | Weapons |
| | System Consultancy Services (1975) | ICT |
| *1980-89* | AIROD (1984) | Aero-space |
| | Caidmark (1980) | Aero-space/ICT |
| | ME&O (1985) | ICT |
| | SMEO (1993) | Weapons |
| | MMC Defence (1986) | Auto-motive |
| | PSCNDSB (1995) | Maritime |
| | D'Aquarian | Maritime |
| | ATSC | Aero-space |
| | SMEAv | Aero-space |
| *1990-99* | SMEA (1992) | Aero-space |
| | Zetro | Aero-space |
| | ATSB | Aero-space |
| | CTRM (1991) | Aero-space |
| | Ikramatik (1999) | Aero-space/ICT |
| | DRB Hicom/DEFTECH (1996) | Auto-motive |
| | Sapura Defence (1995) | ICT |
| | UPECA (2005) | Aero-space |
| *2000-* | Boustead Naval Dockyard (2005) | Maritime |
| | Labuan Shipyard | Maritime |

Source: Malaysian Defence Industry Council (MDIC), registered members, 15 May 2006; <www.mod.gov.my>

Many defence companies maintain close ties with the government and are highly dependent on the MAF for continuous business. The MOD is thus the largest customer of these local companies: in 2005 MOD contracts for through-life support of equipment for the three services were worth a total of RM 646.15 million.[63] Of late, due to increasing international economic pressure, many local companies have opted to diversify their markets

[62] Malaysia, MOD, *Defence Industry Blue-Print Report* (Kuala Lumpur: MOD, 2002); MOD, Defence Industry Blueprint Workshop, Regency Hotel, Port Dickson, 10-12 October 2002.
[63] Information obtained from Procurement Division, MOD, Malaysia, 2006.

towards a dual-use strategy, instead of solely depending on defence. Many companies have set up defence-based subsidiary companies within their overarching commercial businesses.

**Table 2: Malaysia's Current Defence Industry Capability, 2006**

| Sector Capability | Aerospace | Automotive | Maritime | Weapons | ICT |
|---|---|---|---|---|---|
| *R&D* | Low | Low | Low | Low | Low |
| *Design* | Low | Low | Low | Low | Medium |
| *Manufacturing* | High | Medium | Low | Medium | N/A |
| *MRO/Overhaul* | Medium | High | High | Medium | Medium |
| *Integration* | Medium | Medium | Low | N/A | Medium |
| *Assembly* | Medium | Medium | Medium | Medium | Medium |
| *Prime Company* | Airod, SME-A, CTRM, Excelnet, IKramatik | DRB-HiCom MMC Defence Pesaka Astana | PSCNDSB, MSE Eng Sabah Shipyard | SMEO | Sapura SCS Zetro |

Source: Ministry of Defence, Malaysia, 2006.[64]

More generally, however, growth of the Malaysian defence industry is constrained by several factors. First is the absence of any clear policy guidance outlining a national acquisition and defence industrial strategy. The defence procurement process makes no clear provision for local content or indigenous industrial participation. In the absence of any strategic or coherent plan managed under one umbrella organisation, overseeing and monitoring defence industry development, local agencies tend to operate in isolation of each other. In the past, this has created complications and impediments in terms of duplication of effort and conflicting objectives and strategies. The Malaysian MOD, for example, has jealously guarded its prerogatives concerning national defence industrial activities, claiming that they are an essential task of the ministry. Furthermore, there are lingering issues pertaining to the follow-up of the policies by the relevant institutions involved.

There is also some resentment over the operations of the MDIC and how it is only benefiting pockets of the industry within the MDIC group. In fact, the DIB, which was adopted and published in 2005, is often referred to as mundane document, and that it needs to be reviewed and revised in order to cater to the future continued development in the defence industrial sector.

[64] This table has been modified from the original table prepared by PRIMA Consulting Services, a consultant under the MIGHT group as part of the Defence Industry Blueprint. PRIMA was appointed to draw up the draft Malaysian Defence Industry Blue Print. The table is cited with the permission of the Ministry of Defence, Malaysia although the blueprint is still in the form of a draft.

Other challenges include lack of industrial capability and capacity availability of high skilled workers and escalating costs of defence equipment, refusal for technology sharing and the lack of supply chain.

At issue, then, is the capacity of this industry to support involvement by the MAF in the RMA.

## Malaysia's Defence Industry and the RMA

Defence transformation, or the RMA, is used interchangeably. There are various interpretations of this term. It generally refers to the introduction and implementation of new thinking with regards to strategy and tactics, military organisation and doctrines, force structure and overall weapons acquisition. The RMA is more than simply modernisation efforts. It entails a quantum leap in military advancement, embodies development both in terms of 'hardware' in the form of technology, weapons and platforms, and of software in the form of organisational and doctrinal innovation.[65] Consequently, the RMA is driven by various factors, such as changes in the global security environment following the end of the cold war, globalisation and the rapid advancement in the information technology sector. Newer concepts such as command, control, communications, computing, intelligence, surveillance and reconnaissance (C4ISR) networks, network-centric or network-enabled warfare, and the digitisation of ground forces have simply become key components of the RMA.

Malaysia has not formally adopted the RMA as an official doctrine, but it has nevertheless embarked on a course of substantial military modernisation and impressive technological upgrading of its armed forces since the early 1990s. The changing security landscape in the post Cold War-era, followed by the technological advancement in defence materiel, has created the need for Malaysia to purchase new equipment as well as upgrade and overhaul the old ones. The shift from conventional threats to more non-conventional security concerns, such as piracy, drug and human trafficking, border control and illegal immigration, has necessitated platforms and weapons that could cater to these challenges. Purchases over the past decade has concentrated on items such as submarines, fighter aircraft, attack helicopters, modern battle tanks and various types of tactical missile systems integrated with advanced avionics and radar systems. In addition, these purchases have necessitated increased interoperability between the various types of equipment available, as well as between the air, naval, and ground forces of the Malaysian military. This has caused a shift in emphasis by the MAF away from procurement of traditional platform-centric equipment toward information technology- and network-based systems. The MAF,

[65] Richard A. Bitzinger, 'Come the Revolution: Transforming the Asia-Pacific's Militaries', *Naval War College Review* (Autumn 2005), pp. 40-1, 44.

therefore, are already incorporating concepts such as C4ISR and net-centric operations into its force structure and operational thinking.

The current process of Malaysia's military modernisation development has had some effect on the local defence industry. Several local firms have acquired at some capability in such areas as C4ISR and networking, and Malaysia has even developed its own unmanned aerial reconnaissance vehicle. These companies are working closely with the MAF to further develop their capabilities in these areas in order to meet future requirements of the military. However, despite the efforts to promote local content and industrial participation, Malaysia remains highly dependent on imports of defence equipment, especially those that may contribute to any possible Malaysian RMA. Overall, while Malaysia is a long ways away from any kind of 'revolution in military affairs', its modernisation plans have at least been moving in this direction.

This suggests that the Malaysian defence industry has yet to reach its potential. Despite considerable investment and strong government infrastructural and monetary support, the local defence sector is still struggling to take-off. The industry's capability is still confined to basic manufacturing activities and MRO operations, and local defence manufacturing is still confined to a limited number of sectors, with minimal R&D activities or export opportunities. Despite the requirement for local content and industrial participation, more than ninety percent of the equipment used by the MAF is still sourced offshore. Various reasons are given for this poor performance. At the national level, it is claimed that there is no concerted effort to ensure that policy relating to defence industry development is implemented effectively. This has led to accusations of a lack of transparency and consistency in the selection and awarding of contracts to deserving local industrial players. There have also been allegations as to the commitment and sincerity on the part of government when it comes to truly wanting to develop a strong defence industrial base. Further, offshore suppliers are often accused of not wanting to transfer and share technology towards developing the local defence industry. OEMs are often said to lack the trust in departing, mainly their defence technologies for fear of competition. On the other hand, local companies who are either recipients of the technology or workshares are also blamed for not possessing the capabilities and capacities to undertake the necessary work. Finally, it is claimed that the MAF themselves are still wary of locally produced product and services. These issues, taken together, constitute a significant barrier to the development and growth of the Malaysian defence industry.

In light of these concerns, and considering the economic and strategic significance of the defence industry, greater effort by the Government to foster a value-adding and competitive Malaysian defence industry does seem warranted. This seems likely to entail constant review of local defence

industry performance, as well as the implementation of stronger government intervention in the policies, processes and implementation mechanisms.

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